

**Amendment and Response**

Page 8 of 13

Serial No.: 09/772,598

Confirmation No.: 2967

Filed: January 30, 2001

For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD SYNTHETASE**Remarks**

The Office Action mailed April 20, 2004 has been received and reviewed. Claims 35, 38, and 66 have been canceled solely to simplify the outstanding issues. Applicants reserve the right to prosecute claims 35, 38, and 66 in continuing applications. Claims 35, 38, and 66 having been canceled herein, and claims 54, 56, 60, and 64 having been amended, the pending claims are claims 39-65.

Claims 54, 56, 60, and 64 have been amended to delete the term "effectively."

Reconsideration and withdrawal of the rejections are respectfully requested.

**Incorporation by Reference**

The Examiner alleged that Applicants' amendments to the specification and claims in the Amendment and Response filed January 23, 2004 included an improper incorporation by reference, as the amendment was not accompanied by an affidavit or declaration executed by the Applicants, or a practitioner representing the Applicants, stating that the amendatory material consists of the same material incorporated by reference in the referencing application and was inadvertently omitted. Applicants respectfully disagree.

First, Applicants' Representatives are unaware of any requirement for a statement that amendatory material, which has been incorporated by reference to a *provisional application*, was *inadvertently omitted*. The Examiner points to M.P.E.P. §201.06(c) for support. M.P.E.P. §201.06(c), which is directed to "Divisional-Continuation Procedure," states that "[t]he incorporation by reference statement can only be relied upon to permit the entering of a portion of the prior application into the *continuation or divisional application* when the portion of the prior application has been inadvertently omitted from the submitted application papers in the continuation or divisional application." However, the present application is not a *continuation or divisional application*. Thus, Applicants respectfully submit that M.P.E.P. §201.06(c) is inapplicable to the present application.

**Amendment and Response**

Page 9 of 13

Serial No.: 09/772,598

Confirmation No.: 2967

Filed: January 30, 2001

For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD SYNTHETASE

---

Second, a Declaration executed by Applicants' Representative stating that the amendatory material consists of the same material incorporated by reference in the referencing application is being submitted herewith.

Thus, Applicants respectfully submit that the incorporation by reference is proper. Applicants respectfully request that the Examiner reconsider and withdraw the objection to the amendments to the specification and claims for improperly incorporating by reference in the Amendment and Response filed January 23, 2004.

**Rejection under 35 U.S.C. §112, Second Paragraph**

The Examiner rejected claims 54-57, 60, 61, and 64 under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention. Specifically, the Examiner alleged that the phrase "effectively diffracts x-rays" is vague and indefinite. Applicants respectfully disagree. Applicants respectfully submit that claims 54-57, 60, 61, and 64, in view of the present specification, are clear and distinctly convey Applicants' claimed invention to one of skill in the art.

However, in the interest of expediting the prosecution of the present application, claims 54, 56, 60, and 64 have been amended to delete the term "effectively." Thus, Applicants respectfully submit that claims 54-57, 60, 61, and 64 (as amended) are neither vague nor indefinite, and that the rejection has been obviated. Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §112, second paragraph.

**Rejection under 35 U.S.C. §103**

The Examiner rejected claim 38 under 35 U.S.C. §103(a) as being unpatentable over Kunsch et al. (U.S. Publication No. 2003/0054436) in view of Rizzi et al. ("Crystallization of NAD<sup>+</sup> Synthetase from *Bacillus subtilis*," *Proteins: Structure, Function, and Genetics*, 1996;26:236-238) or Sambrook et al. ("Molecular Cloning: A Laboratory Manual," Second

***Amendment and Response***

Page 10 of 13

*Serial No.: 09/772,598**Confirmation No.: 2967**Filed: January 30, 2001**For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD SYNTHETASE*

Edition. 1989, Cold Springs Harbor Laboratory Press, Cold Springs Harbor, NY, pgs. 17.29-17.30) or Worthington ("Worthington Enzyme Manual: Enzymes and Related Biochemicals," section XIV, Worthington Biochemical Corporation, Freehold, NJ (1993)). The Examiner also rejected claims 35 and 38 under 35 U.S.C. §103(a) as being unpatentable over Crystal Screen™ (Hampton Research) in view of Kunsch et al. (U.S. Publication No. 2003/0054436).

Claims 35 and 38 having been canceled herein, Applicants respectfully submit that the rejection has been rendered moot. Applicants respectfully request that the Examiner reconsider and withdraw the rejection under 35 U.S.C. §103.

**Rejection under 35 U.S.C. §112, First Paragraph**

The Examiner rejected claims 44-66 under 35 U.S.C. §112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Specifically, the Examiner alleged that the introduction of claims 44-66 in the Amendment and Response filed January 23, 2004, was new matter. Applicants respectfully traverse the rejection.

First, the Examiner alleged that there is no support in the specification for the term "effectively" in claim 54. Claim 54 has been amended to delete the term "effectively." Moreover, Applicants respectfully submit that the diffraction of x-rays by a crystal is supported by the specification as a whole, and specifically at, for example, the description of Table 1 in the specification at page 14, lines 18-29. Thus, Applicants respectfully submit that the rejection of claim 54 (and dependent claim 55) has been obviated.

Next, the Examiner alleged that claims 58-61 rely on material improperly incorporated by reference. Applicants respectfully submit that the incorporation by reference is proper, as has been discussed herein above in the section entitled "Incorporation by Reference."

Finally, the Examiner stated that "[t]he production of one crystal with particular characteristics (space group symmetry, unit cell dimensions, structure coordinates, etc) does not

*Amendment and Response*

Page 11 of 13

Serial No.: 09/772,598

Confirmation No.: 2967

Filed: January 30, 2001

For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD SYNTHETASE

---

establish contemplation of *all* crystals (i.e., *Staphylococcus aureus* NAD synthetase) having some or all of the characteristics" (page 6, first paragraph of the Office Action mailed April 20, 2004; emphasis added). Applicants do not understand the intended meaning of the Examiner's statement, as claims 44-53, 56-57, and 62-65 (as amended) are not drawn to methods of forming *all* crystals of *Staphylococcus aureus* NAD synthetase. Conversely, each of claims 44-53, 56-57, and 62-65 (as amended) are drawn *only* to methods of forming crystals having the specific recited characteristics, as discussed herein below.

Specifically, claims 44-45 are drawn *only* to methods of forming a crystal having the monoclinic space group symmetry  $P2_1$ ; claims 46-47 are drawn *only* to methods of forming a crystal having a unit cell having dimensions of a, b, and c; wherein a is about 40Å to about 60Å, b is about 90Å to about 120Å, and c is about 80Å to about 110Å; and wherein  $\alpha = \gamma = 90^\circ$  and  $\beta$  is about  $80^\circ$  to about  $120^\circ$ ; claims 48-49 are drawn *only* to methods of forming a crystal having atoms arranged in a spatial relationship represented by the structure coordinates listed in Table 1; claims 50-51 are drawn *only* to methods of forming a crystal having an *S. aureus* NAD synthetase amino acid sequence SEQ ID NO:1; claims 52-53 are drawn *only* to methods of forming a crystal having an *S. aureus* NAD synthetase amino acid sequence SEQ ID NO:1, except that at least one methionine is replaced with selenomethionine; claims 56-57 (as amended) are drawn *only* to methods of forming a crystal that diffracts x-rays to a resolution of 1.5Å to 3Å; and claims 62-65 (as amended) are drawn *only* to methods of forming a crystal that has at least one dimension of 0.15-0.8 mm. In the event that the present rejection is maintained, Applicants respectfully request clarification of the basis for the rejection in the next Official Communication.

Moreover, Applicants respectfully submit that the crystallization conditions recited in independent claims 44, 46, 48, 50, 52, 56, and 62 (as amended) are directly supported by the written description in the specification at, for example, page 9, lines 8-13, and originally filed claim 35 (which is also part of the specification as filed). Similarly, Applicants respectfully

***Amendment and Response***

Page 12 of 13

Serial No.: 09/772,598

Confirmation No.: 2967

Filed: January 30, 2001

For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD SYNTHETASE

submit that the crystallization conditions recited in claims 45, 47, 49, 51, and 53 are directly supported, for example, by the working examples in the specification at page 42, lines 6-7.

Further, the Examiner alleged that the disclosure provides "only specific set of crystallization conditions that would result in, for example, a crystal of *Staphylococcus aureus* NAD synthetase with the monoclinic space group P2," (paragraph spanning pages 5-6 of the Office Action mailed April 20, 2004). As discussed herein above, method claims 44-53, 56-57, and 62-65 (as amended) recite methods that include specific sets of crystallization conditions for forming crystals having the specific recited characteristics. Thus, Applicants do not understand the intended meaning of the Examiner's statement. In the event that the present rejection is maintained, clarification of the basis for the rejection is respectfully requested in the next Official Communication.

Based on the remarks presented herein above, Applicants respectfully submit that the specification provides a written description adequate to support claims 44-66 under 35 U.S.C. §112, first paragraph. Reconsideration and withdrawal of the rejection under 35 U.S.C. §112, first paragraph, is respectfully requested.

**Allowable Subject Matter**

Applicants thank the Examiner for indicating that claims 39-43 have been allowed.

**Amendment and Response**

Page 13 of 13

Serial No.: 09/772,598

Confirmation No.: 2967

Filed: January 30, 2001

For: CRYSTALLIZATION AND STRUCTURE DETERMINATION OF STAPHYLOCOCCUS AUREUS NAD  
SYNTHETASE**Summary**

It is respectfully submitted that all the pending claims are in condition for allowance and notification to that effect is respectfully requested. The Examiner is invited to contact Applicants' Representatives, at the below-listed telephone number, if it is believed that prosecution of this application may be assisted thereby.

Respectfully submitted for  
Benson et al.

By  
Mueeting, Raasch & Gebhardt, P.A.  
P.O. Box 581415  
Minneapolis, MN 55458-1415  
Phone: (612) 305-1220  
Facsimile: (612) 305-1228  
Customer Number ~~26813~~

July 20, 2004  
Date

By: [Signature]  
Loren D. Albin  
Reg. No. 37,763  
Direct Dial (612)305-1225

**CERTIFICATE UNDER 37 CFR §1.8:**

The undersigned hereby certifies that the Transmittal Letter and the paper(s), as described hereinabove, are being transmitted by facsimile in accordance with 37 CFR §1.6(d) to the Patent and Trademark Office, addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on this

20<sup>th</sup> day of JULY, 2004, at 2:43 PM (Central Time).

By: [Signature]  
Name: SAM HER